Interplay between the Kondo effect and randomness in M_xTiSe$_2$ (M = Co, Ni, and Fe) single crystals

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We report interplay between Kondo effect and randomness in M_xTiSe$_2$ (M = Co, Ni, and Fe) single crystals. Although the typical low-T upturn of resistivity is measured to imply Kondo effect around the single-ion Kondo temperature T_K, positive magnetoresistance linearly proportional to magnetic field and power-law scaling of magnetization suggest the forbidden coexistence between Kondo effect and time reversal symmetry breaking. This puzzling result is resolved from the Griffiths scenario, that is, disorder-induced distribution of the Kondo temperature causes an effective Kondo temperature (T_K^{eff}) much lower than T_K, allowing unscreened local moments above T_K^{eff} and resulting in non-Fermi liquid properties in M_xTiSe$_2$ below the percolation threshold ($x < x_c$). We demonstrate that magnetoresistance is an another important tool for investigating non-Fermi liquid.